Remarks: General

The claims have not been amended herein. A complete listing of all claims indicating the status thereof is shown in the attached **Appendix A** (pages 9~10).

A petition under 37 CFR §1.136 for a two-month extension of time to respond the Examiner's action is enclosed, the fee for which should be charged to Deposit Account No. 04-1928 (E.I. du Pont de Nemours and Company). If any fee other than or in addition to the extension fee is required to authorize or obtain consideration of this response, please charge such fee to Deposit Account No. 04-1928.

Claims 1, 3~6, 9~12 and 43~47 remain active in the application. Applicant hereby requests reconsideration and further examination of the application in view of the reasons it has set forth below for allowance of the claims.

Remarks: Detailed Action

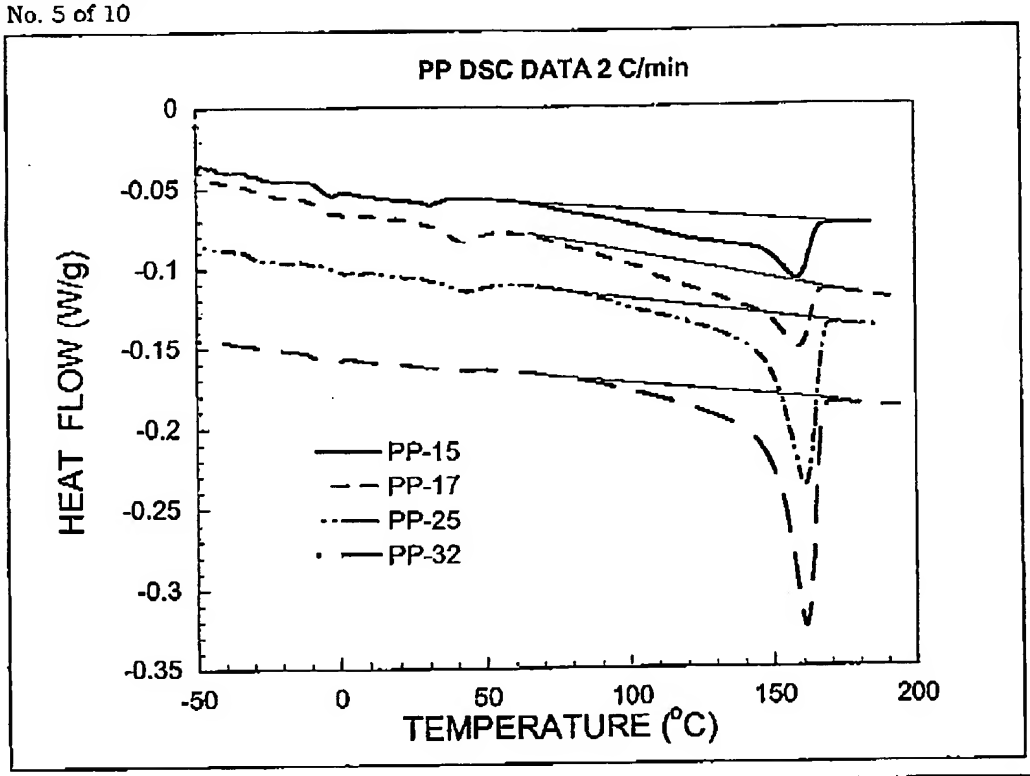
The Examiner has rejected Claims 1, 3~6, 9~12 and 43~47 under 35 U.S.C. §103(a) as being unpatentable over WO 03/008680 ("Sen") in view of WO 93/15251 ("Gessner").

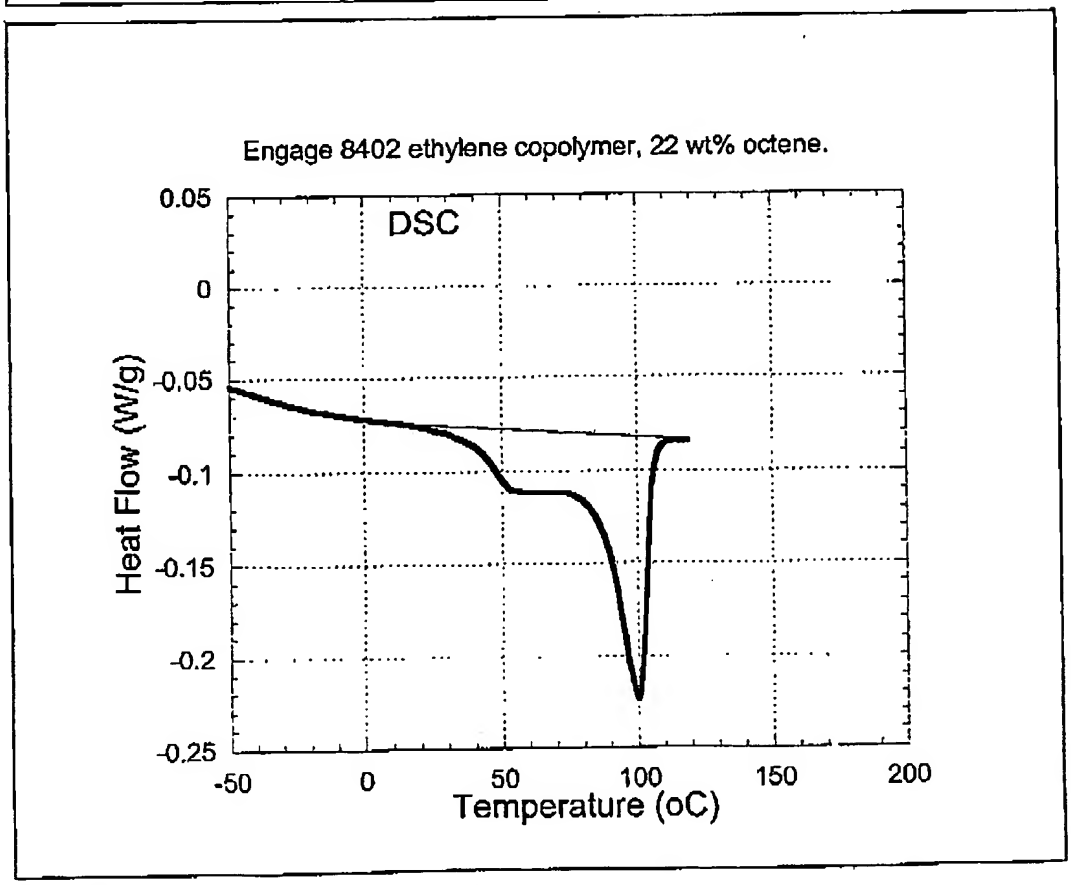
Sen discloses (1) a bicomponent fiber of a core/sheath construction in which the core comprises a thermoplastic elastomer, and the sheath comprises an elastomeric polymer such as a homogeneously branched polyolefin; and (2) a biconstituent fiber in which one constituent comprises a thermoplastic elastomer, and the other constituent comprises an elastomeric polymer such as a homogeneously branched polyolefin.

In the fibers of Sen, the component that serves as the core in a core/sheath construction is prepared from a polymer illustrated by a diblock, triblock or multiblock copolymer. Some of the different copolymers disclosed for use as this component are illustrated by those having blocks prepared, variously, from styrenes, urethanes or esters, and include specifically a polyether block amide. The other component, which serves as the sheath in a core/sheath construction, is prepared from a polymer that is illustrated by a homogeneously branched polyolefin. Sen states that the essential feature of the various fiber configurations is that at least part, preferably at least a major part, of the external surface of the fiber comprises the adhesive, or lower melting, of the two materials (Component B), such as the homogeneously branched polyolefin. (Page 6 at Lines 15~18).

The fibers of Sen in bicomponent form are defined by their stated core/sheath structure, and the structure of the biconstituent fiber of Sen is more particularly defined as being "a fiber comprising an intimate blend of at least two polymer constituents. The structure of the biconstituent fiber is an islands-in-the-sea construction." (Page 6 at Lines 21~23). To meet the condition described above in which at least part, preferably at least a major part, of the external surface of the fiber comprises the adhesive, or lower melting, of the two materials, it may be inferred that the "sea" portion of the islands-in-the-sea fiber is the lower melting Component B.

Sen states on page 7 at lines 15~24 that the homogeneously branched polyolefin that typifies Component B has a melting point at or below 110°C as measured by DSC. By contrast, the propylene polymer contained in Applicant's fiber has an end of melting at about 160°C. Different types of propylene polymers, both propylene homopolymers and ethylene/propylene copolymers, may serve as the component in Applicant's fiber that has an end of melting at about 160°C, and DSC curves for four of them that are homopolymers with varying degrees of crystallinity are shown in the upper panel on the following page (the number following the "PP" reference tag for each polymer indicates the crystallinity thereof). By contrast, the DSC curve for a homogeneously branched ethylene/octane copolymer that typifies Sen's Component B is shown in the lower panel. It may be seen that these two different types of polymers have very different melting behavior.


PP DSC DATA 2 C/min
HEAT FLOW (W/g)
0
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
-0.35
PP-15
PP-17
PP-25
PP-32
-50
0
50
100
150
200
TEMPERATURE (°C)


Engage 8402 ethylene copolymer, 22 wt% octene.
DSC
Heat Flow (W/g)
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
-50
0
50
100
150
200
Temperature (oC)

Structural differences have also previously been noted between the fibers of Sen and the fibers claimed herein, in which an olefinic thermoplastic, elastomeric polymer is dispersed in a matrix of a segmented thermoplastic, elastomeric polymer. That is, the location of the polymer in Applicant's claimed fiber that corresponds most closely to the Component B as used by Sen is reversed. Sen places the Component B material on the exterior of the fiber as it lower melting and thus has adhesive properties. In Applicant's fiber, by contrast, a propylene thermoplastic, elastomeric polymer is dispersed in a matrix of a segmented thermoplastic, elastomeric polymer.

Gessner discloses a nonwoven fabric produced by melt spinning substantially continuous filaments of a thermoplastic olefin-based elastomer. The polymers employed by Gessner may include a thermoplastic block copolymer elastomer such as a polypropylene based co- or terpolymer. The polymer is illustrated by a heterophasic block copolymer containing a (i) crystalline base polymer block of a propylene/α-olefin copolymer, (ii) an amorphous copolymer block of an α-olefin and propylene with or without a diene or other termonomer, and (iii) a semi-crystalline copolymer block of primarily an α-olefin. (Col/line 10/27 to 11/4). Other elastomeric polymers that are useful according to Gessner include polypropylene, polyether/ester elastomers, and blends thereof.

Gessner thus does disclose that the polymer from which filaments, and ultimately a fabric, may therein be made includes a blend of polypropylene and polyether/ester elastomer. There is, however, no teaching or suggestion in Gessner of the use of the particular type of propylene polymer as described in Claim 1, or that such propylene polymer is dispersed in a matrix of a segmented thermoplastic, elastomeric polymer. Such a blend is not used in any of the examples in this reference. Gessner thus shows no appreciation for the usefulness of the configuration adopted by Applicant in its fiber, in which a propylene polymer is dispersed in a matrix of a segmented thermoplastic, elastomeric polymer, and offers the artisan no guidance in the selection of which of the polymers disclosed in the Gessner reference should be selected for dispersion in

which other polymer, to the extent that the desirability of adopting such a design for the fiber structure is recognized in the first place. Gessner thus does not overcome the deficiencies of Sen, wherein there is also a failure to recognize the usefulness of dispersing a propylene polymer in a matrix of a segmented thermoplastic, elastomeric polymer, and wherein there is actually a teaching of what is essentially an opposite configuration.

There is a beneficial result obtained in the fiber configuration as adopted by Applicant as compared to the opposite configuration taught by Sen, and Gessner offers no suggestion of reversing Sen's configuration to obtain the benefits of dispersing a propylene thermoplastic, elastomeric polymer in a matrix of a segmented thermoplastic, elastomeric polymer, as Applicant has done. The beneficial result obtained in Applicant's claimed fiber is related to the better elastic recovery and elastic power offered by higher melting propylene crystal hard domains in the propylene polymers as used in the fiber. By contrast, polyethylene crystal hard domains tend to yield and plastically deform due to their lower melting temperature, and, under stress, they have poorer elastic and mechanical properties, particularly at elevated temperatures.

It may therefore be seen that the cited references, alone or together, do not teach or suggest a fiber in which improved elastic and mechanical properties are provided by selecting a propylene thermoplastic, elastomeric polymer characterized by a crystallinity of from about 10 to about 40% and an end of melting at about 160°C as one of the components from which the fiber is made, and by carefully selecting its position in the fiber such that it is dispersed in a matrix of the other component, a segmented thermoplastic, elastomeric polymer. Applicant therefore respectfully requests that the Examiner withdraw the rejection of the pending claims under 35 U.S.C. §103(a).

In view of the foregoing, Applicant submits that all of the Examiner's objections and rejections have been properly traversed, and that the pending claims are in condition for allowance, request for which is hereby respectfully made.

Respectfully submitted,

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I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office on December 7, 2006.

Date: December 7, 2006

John A. Langworthy